UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/998,489	11/30/2001	Matt Hayek	CS11336	6375

20280 7590 01/10/2005

MOTOROLA INC
600 NORTH US HIGHWAY 45
ROOM AS437
LIBERTYVILLE, IL 60048-5343

EXAMINER	
PEREZ GUTIERREZ, RAFAEL	
ART UNIT	**PAPER NUMBER**
2686	

DATE MAILED: 01/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS
UNITED STATES PATENT AND TRADEMARK OFFICE
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450
www.uspto.gov

MAILED
JAN 10 2005
Technology Center 2600

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/998,489
Filing Date: November 30, 2001
Appellant(s): Hayek et al.

Roland K. Bowler, II
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed August 18, 2004.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The Appellant's statement of the status of amendments after final rejection contained in the brief is incorrect. The amendment after final rejection filed on June 24, 2004 has been entered.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The Appellant's statement of the issues in the brief is substantially correct. The changes are as follows: Issue 2. Whether Claims 15-17 are patentable over Atkinson in view of US Patent No. 6,487,419 (Freed) under 35 USC 103(a).

(7) Grouping of Claims

Appellant's brief includes a statement that claims 11-25 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

6,192,225 B1	ARPAIA ET AL.	2-2001
2001/0039182 A1	ATKINSON	11-2001
6,487,419 B1	FREED	11-2002

Mouly et al., "The GSM System for Mobile Communications", Cell & Sys., 1992, pp. 217 and 218

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Note: In response to Appellant's challenge to the Official Notice rejection of claims 11 and 22, the added reference of Mouly et al. is provided as evidenced to support the rejection.

Claims 11, 13, 14, 18, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Atkinson (U.S. Patent Application Publication # 2001/0039182 A1)** in view of **Mouly et al. ("*The GSM System for Mobile Communications*")**.

Consider **claims 11 and 24**, Atkinson clearly shows and discloses a method in intermediate frequency and direct conversion receivers, comprising:

receiving a signal (figure 2 and page 2 paragraph 0017); and

providing a local oscillator signal 34 (mixer injection frequency) (figure 2) at a frequency (i.e., 1.35 GHz) different than the received frequency (1.8 GHz) by dividing a voltage controlled oscillator (VCO) 38 output by a frequency divide ratio (figure 2 and page 2 paragraphs 0018 and 0019),

the VCO 38 having a frequency F_3 outside received signal harmonics (figure 2 and page 2 paragraph 0020).

Although Atkinson does not specifically disclose that the frequency F_3 is also outside a bandwidth of received signal harmonics, Atkinson's invention utilizes a RF input signal from a global system for mobile communication (GSM) operating at 1800 MHz and a VCO frequency at 1350 MHz (paragraphs 0019, 0025, and 0026) and Atkinson further discloses that the VCO frequency is not harmonically related to the frequency of the RF input signal (paragraph 0020).

It is well known in the art, as evidenced by Mouly et al., that the channel bandwidth for a GSM system operating at 1800 MHz is 200 KHz (figure 4.17 and pages 217 and 218), therefore, the bandwidth of the RF input signal in Atkinson is 200 KHz. Since Atkinson teaches that the VCO frequency is not harmonically related to the frequency of the RF input signal, it becomes obvious from the teachings of Atkinson and Mouly et al. that the VCO frequency would be outside the bandwidth of received signal harmonics with implementation in the GSM system, as suggested by Atkinson, in order to further minimized any effect in VCO 38 from a potential

coupling of the received signal (Atkinson; page 2 paragraph 0020).

Consider **claim 13, 14, and 18**, and **as applied to claim 11 above**, although Atkinson, in view of Mouly et al., does not specifically discloses that the frequency divide ratio is greater or equal to one, Atkinson does discloses that the frequency divide ratio can be selected such that the received signal is mixed at a local oscillator frequency outside a bandwidth of a fundamental frequency of the received signal (e.g., outside the channel bandwidth of 200 KHz) or a local oscillator frequency derived from a VCO frequency that is outside a bandwidth of the nth harmonic of the received signal (page 2 paragraphs 0019 and 0020).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings of Atkinson to specifically select a frequency divide ratio greater or equal to one that would have maintained the local oscillator frequency outside the bandwidth of harmonics or fundamental frequency of the received signal in order to prevent leakage of the local oscillator frequency.

Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Atkinson (U.S. Patent Application Publication # 2001/0039182 A1)** in view of **Mouly et al. ("*The GSM System for Mobile Communications*") as applied to claim 11 above**, and further in view of **Freed (U.S. Patent # 6,487,419).**

Consider **claims 15-17**, and **as applied to claim 11 above**, Atkinson, in view of Mouly et al., clearly discloses the claimed invention except the steps of determining the signal strength and bit error rate (BER) (condition) of the received signal and increasing a gain of the received signal

before mixing if the gain of the received signal is below a gain threshold.

Freed clearly discloses the steps of determining the signal strength (condition) of a received signal at a wireless device and increasing a gain (condition) of the received signal before mixing if the gain of the received signal is below a gain threshold (abstract and column 2 line 20 - column 3 line 26).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to further modify the teachings of Atkinson, in view of Mouly et al., with the teachings of Freed to determine the signal strength of the received signal and allow the control of the gain of the received signal if the gain of the received signal is below a gain threshold in order to efficiently manage the power consumption of the wireless device.

Claims 19 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Arpaia et al. (U.S. Patent # 6,192,225 B1)**.

Consider **claims 19 and 25**, Arpaia et al. clearly show and disclose a method in an RF receiver, comprising:

receiving a signal within a passband of a preselector filter 1 of the receiver (figure 2, column 3 lines 20-25 and column 4 lines 1-6);

mixing the received signal at a local oscillator (mixer injection) frequency f_0 outside the passband of the preselector filter 1 (figure 2, column 4 lines 47-50, and column 4 line 58 - column 5 line 3); and

chopping the received signal after mixing at a chopper frequency, the chopper frequency

proportional to the local oscillator (mixer injection) frequency f_0 (figure 2 and column 4 lines 21-57).

Arpaia et al. do not disclose chopping the signal before mixing, however, since Arpaia et al., also disclose that the received signal is not affected by phase change element 5 and inverters 9, 9' (choppers), it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings of Arpaia et al. to also chop the received signal before mixing in order to improve the elimination of second-order products of the received signal (Arpaia et al.; column 4 lines 34-50).

Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Arpaia et al. (U.S. Patent # 6,192,225 B1)** in view of **Freed (U.S. Patent # 6,487,419)**.

Consider **claims 20 and 21**, and **as applied to claim 19 above**, Arpaia et al. clearly disclose the claimed invention except the steps of increasing a gain of the received signal before mixing if the gain of the received signal is below a gain threshold, mixing the received signal at a local oscillator frequency outside the passband of the preselector filter when the gain is above a threshold and within the passband when the gain is below a threshold.

Freed clearly discloses the steps of determining the gain of a received signal at a wireless device, increasing a gain of the received signal before mixing if the gain of the received signal is below a gain threshold, and mixing the received signal at a local oscillator frequency outside the passband of the preselector filter when the gain is above a threshold and within the passband when the gain is below a threshold (abstract and column 2 line 20 - column 3 line 26).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Arpaia et al. with the teachings of Freed to determined the gain of the received signal and allow the control of the gain of the received signal if the gain of the received signal is below a gain threshold in order to efficiently manage the power consumption of the wireless device.

Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Arpaia et al. (U.S. Patent # 6,192,225 B1)** in view of **Atkinson (U.S. Patent Application Publication # 2001/0039182 A1)**, and further in view of **Mouly et al. ("*The GSM System for Mobile Communications*")**.

Consider **claims 22 and 23**, and **as applied to claim 19 above**, Arpaia et al. clearly disclose the claimed invention except that the local oscillator frequency is derived from a VCO frequency outside a bandwidth of received signal harmonics, the VCO frequency provided by dividing the VCO output by a frequency divide ratio that corresponds to the harmonic of the received signal.

Atkinson clearly shows and discloses a method in intermediate frequency and direct conversion receivers comprising, among other steps, the step of providing a local oscillator signal 24 (mixer injection frequency) (figure 2) by dividing a voltage controlled oscillator (VCO) 38 output by a frequency divide ratio (figure 2 and page 2 paragraphs 0018 and 0019), and the VCO 38 having a frequency F_3 outside of received signal harmonics (figure 2 and page 2 paragraph 0020).

Although Atkinson does not specifically disclose that the frequency F_3 is also outside a bandwidth of received signal harmonics and that the local oscillator frequency is derived from a VCO frequency that is outside a bandwidth of the nth harmonic of the received signal, Atkinson's invention utilizes a RF input signal from a global system for mobile communication (GSM) operating at 1800 MHz and a VCO frequency at 1350 MHz (paragraphs 0019, 0025, and 0026) and Atkinson further discloses that the VCO frequency is not harmonically related to the frequency of the RF input signal (paragraph 0020).

It is well known in the art, as evidenced by Mouly et al., that the channel bandwidth for a GSM system operating at 1800 MHz is 200 KHz (figure 4.17 and pages 217 and 218), therefore, the bandwidth of the RF input signal in Atkinson is 200 KHz. Since Atkinson teaches that the VCO frequency is not harmonically related to the frequency of the RF input signal, it becomes obvious from the teachings of Atkinson and Mouly et al. that the VCO frequency would be outside the bandwidth of received signal harmonics with implementation in the GSM system, as suggested by Atkinson, in order to further minimized any effect in VCO 38 from a potential coupling of the received signal (Atkinson; page 2 paragraph 0020).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings Arpaia et al. with the teachings of Atkinson, in view of Mouly et al., to specifically select a frequency divide ratio greater or equal to one that would have maintained the local oscillator frequency outside the bandwidth of harmonics or fundamental frequency of the received signal in order to prevent leakage of the local oscillator frequency.

(11) Response to Argument

a) Issue 1

Regarding **claim 11**, Appellant argues, on page 5 of the brief, that Atkinson is silent on the relationship between the VCO frequency and the bandwidth of received signals harmonics and that in Atkinson the VCO frequency may be within or without the received signal harmonics since the VCO frequency in Atkinson is not harmonically related to the frequency of the RF input signal indicates nothing about the relationship between the VCO frequency and the bandwidth of received signal harmonics.

The Examiner respectfully disagrees with Appellant's arguments because, as explained above, Atkinson's invention utilizes a RF input signal from a global system for mobile communication (GSM) operating at 1800 MHz and a VCO frequency at 1350 MHz (paragraphs 0019, 0025, and 0026) and Atkinson further discloses that the VCO frequency is not harmonically related to the frequency of the RF input signal (paragraph 0020). It is well known in the art, as evidenced by Mouly et al., that the channel bandwidth for a GSM system operating at 1800 MHz is 200 KHz, therefore, the bandwidth of the RF input signal in Atkinson is 200 KHz. Since Atkinson teaches that the VCO frequency is not harmonically related to the frequency of the RF input signal, it becomes obvious from the teachings of Atkinson and Mouly et al. that the VCO frequency would be outside the bandwidth of received signal harmonics with implementation in the GSM system, as suggested by Atkinson, in order to further minimized any effect in VCO 38 from a potential coupling of the received signal (Atkinson; page 2 paragraph 0020).

Regarding **claim 13**, Appellant argues, on page 6 of the brief, that in Atkinson, if the divide ratio = 1, the VCO 38 frequency F_3 would be equal to the frequency of the input RF signal.

The Examiner respectfully disagrees with Appellant's arguments because Atkinson discloses that the frequency divide ratio can be selected such that the received signal is mixed at a local oscillator frequency outside a bandwidth of a fundamental frequency of the received signal (paragraphs 0019 and 0020). Contrary to Appellant's argument, if the divide ratio is equal to 1, the VCO 38 frequency F_3 would be equal to 1.35 GHz which is outside a bandwidth of a fundamental frequency of 1.8 GHz of the received signal (paragraph 0019).

Regarding **claim 14**, Appellant argues, on page 6 of the brief, that in Atkinson, the frequency divide ratio is < 1 since Atkinson multiplies the VCO frequency F_3 by 4/3 and Atkinson does not make reference to the frequency divide ratio and harmonic number.

The Examiner respectfully disagrees with Appellant's arguments because Atkinson, in view of Mouly et al., discloses that the frequency divide ratio can be selected such that the received signal is mixed at a local oscillator frequency derived from a VCO frequency that is outside a bandwidth of the n^{th} harmonic of the received signal (paragraph 0019 and 0020). As explained above for claim 11, Atkinson discloses that the VCO frequency is not harmonically related to the frequency of the RF input signal (paragraph 0020) and it is well known in the art, as evidenced by Mouly et al., that the channel bandwidth for a GSM system operating at 1800 MHz is 200 KHz, therefore, the bandwidth of the RF input signal in Atkinson is 200 KHz. It is, therefore, obvious from the teachings of Atkinson and Mouly et al. that the VCO frequency is

outside a bandwidth of the n^{th} harmonic of the received signal.

Regarding **claim 18**, Appellant argues, on page 7 of the brief, that Atkinson merely provides a VCO frequency that is not harmonically related to the frequency of the RF input signal, without regard to whether or nor the mixer injection frequency is outside the channel bandwidth of the received signal.

The Examiner respectfully disagrees with Appellant's arguments because Atkinson's invention utilizes a RF input signal from a global system for mobile communication (GSM) operating at 1800 MHz and a VCO frequency at 1350 MHz (paragraphs 0019, 0025, and 0026) and Atkinson further discloses that the VCO frequency is not harmonically related to the frequency of the RF input signal (paragraph 0020). It is well known in the art, as evidenced by Mouly et al., that the channel bandwidth for a GSM system operating at 1.8 GHz is 200 KHz, therefore, the bandwidth of the RF input signal in Atkinson is 200 KHz. Since Atkinson teaches that the VCO frequency is not harmonically related to the frequency of the RF input signal, it becomes obvious from the teachings of Atkinson and Mouly et al. that the VCO frequency is outside the channel bandwidth of the received signal.

Regarding **claim 24**, Appellant argues, on pages 7 and 8 of the brief, that Atkinson is silent on the relationship between the VCO frequency and the bandwidth of received signals harmonics and that in Atkinson the VCO frequency may be within or without the received signal harmonics since the VCO frequency in Atkinson is not harmonically related to the frequency of the RF input signal indicates nothing about the relationship between the VCO frequency and the bandwidth of received signal harmonics.

The Examiner respectfully disagrees with Appellant's arguments because Atkinson's invention utilizes a RF input signal from a global system for mobile communication (GSM) operating at 1800 MHz and a VCO frequency at 1350 MHz (paragraphs 0019, 0025, and 0026) and Atkinson further discloses that the VCO frequency is not harmonically related to the frequency of the RF input signal (paragraph 0020). It is well known in the art, as evidenced by Mouly et al., that the channel bandwidth for a GSM system operating at 1.8 GHz is 200 KHz, therefore, the bandwidth of the RF input signal in Atkinson is 200 KHz. Since Atkinson teaches that the VCO frequency is not harmonically related to the frequency of the RF input signal, it becomes obvious from the teachings of Atkinson and Mouly et al. that the VCO frequency is outside the bandwidth of received signal harmonics.

b) Issue 2

Regarding **claims 15-17**, Appellant argues, on pages 9 and 10 of the brief, that neither Atkinson nor Freed disclose or suggest the conditional mixing.

The Examiner respectfully disagrees with Appellant's argument because, as explained above, Freed clearly disclose the conditional mixing as claimed when Freed discloses determining the signal strength (condition) of the received signal at a wireless device and increasing a gain (condition) of the received signal before mixing if the gain of the received signal is below a gain threshold (abstract and column 2 line 20 - column 3 line 26).

c) Issue 3

Regarding **claims 19 and 25**, Appellant argues, on pages 11 and 12 of the brief, that Arpaia et al. do not mix the received signal with a mixer injection frequency outside the passband of the preselection filter and that Arpaia et al. fail to chop the received signal at a chopper frequency proportional to the mixer injection frequency.

The Examiner respectfully disagrees with Appellant's argument because Arpaia et al. disclose that the mixer injection frequency, by means of the switching oscillator, is outside of the passband of the pre-selection filter (column 4 line 47 - column 5 line 3) and that the mixer injection frequency of the local oscillator and the frequency of the switching oscillator are proportional to each other because they are locked to the same source (column 5 lines 17-20).

d) <u>Issue 4</u>

Regarding **claims 20 and 21**, Appellant argues, on pages 12 and 13 of the brief, that neither Arpaia et al. nor Freed disclose or suggest the conditional mixing.

The Examiner respectfully disagrees with Appellant's argument because, as explained above, Freed clearly disclose the conditional mixing as claimed when Freed discloses determining the gain of the received signal at a wireless device, increasing a gain of the received signal before mixing if the gain of the received signal is below a gain threshold and mixing the received signal at a local oscillator frequency outside the passband of the preselector filter when the gain is above a threshold and within the passband when the gain is below a threshold (abstract and column 2 line 20 - column 3 line 26).

e) Issue 5

Regarding **claim 22**, Appellant argues, on page 14 of the brief, that Atkinson does not distinguish between a VCO having a frequency that is within or without the bandwidth of received signal harmonics since Atkinson merely indicates that the frequency of the VCO is not harmonically related to the frequency of the RF input signal.

The Examiner respectfully disagrees with Appellant's arguments because, as explained above, Atkinson's invention utilizes a RF input signal from a global system for mobile communication (GSM) operating at 1800 MHz and a VCO frequency at 1350 MHz (paragraphs 0019, 0025, and 0026) and Atkinson further discloses that the VCO frequency is not harmonically related to the frequency of the RF input signal (paragraph 0020). It is well known in the art, as evidenced by Mouly et al., that the channel bandwidth for a GSM system operating at 1800 MHz is 200 KHz, therefore, the bandwidth of the RF input signal in Atkinson is 200 KHz. Since Atkinson teaches that the VCO frequency is not harmonically related to the frequency of the RF input signal, it becomes obvious from the teachings of Arpaia et al., Atkinson, and Mouly et al. that the VCO frequency would be outside the bandwidth of received signal harmonics with implementation in the GSM system, as suggested by Atkinson, in order to further minimized any effect in VCO 38 from a potential coupling of the received signal (Atkinson; page 2 paragraph 0020).

Regarding **claim 23**, Appellant argues, on page 15 of the brief, that Arpaia et al. and Atkinson fail to divide a VCO output by a frequency divider that corresponds to a harmonic of the received signal.

The Examiner respectfully disagrees with Appellant's arguments because Atkinson, in view of Mouly et al., discloses that the frequency divide ratio can be selected such that the received signal is mixed at a local oscillator frequency derived from a VCO frequency that is outside a bandwidth of the n^{th} harmonic of the received signal (paragraph 0019 and 0020). As explained above for claim 22, Atkinson discloses that the VCO frequency is not harmonically related to the frequency of the RF input signal (paragraph 0020) and it is well known in the art, as evidenced by Mouly et al., that the channel bandwidth for a GSM system operating at 1800 MHz is 200 KHz, therefore, the bandwidth of the RF input signal in Atkinson is 200 KHz. It is, therefore, obvious from the teachings of Arpaia et al., Atkinson, and Mouly et al. that the VCO frequency is outside a bandwidth of the n^{th} harmonic of the received signal.

Therefore, in view of the above reasons and having addressed each of Appellant's arguments, it is believed that the rejections should be sustained.

Marsha D Banks-Harold
MARSHA D. BANKS-HAROLD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

Marsha D. Banks-Harold & *Lester G. Kincaid*
First Conferee Second Conferee

Respectfully submitted,

Rafael Perez-Gutierrez
R.P.G./rpg
RAFAEL PEREZ-GUTIERREZ
PATENT EXAMINER

January 7, 2005

Motorola, Inc.
Intellectual Property Dept. (RKB)
600 North U.S. Highway 45, AN 475
Libertyville, IL 60048